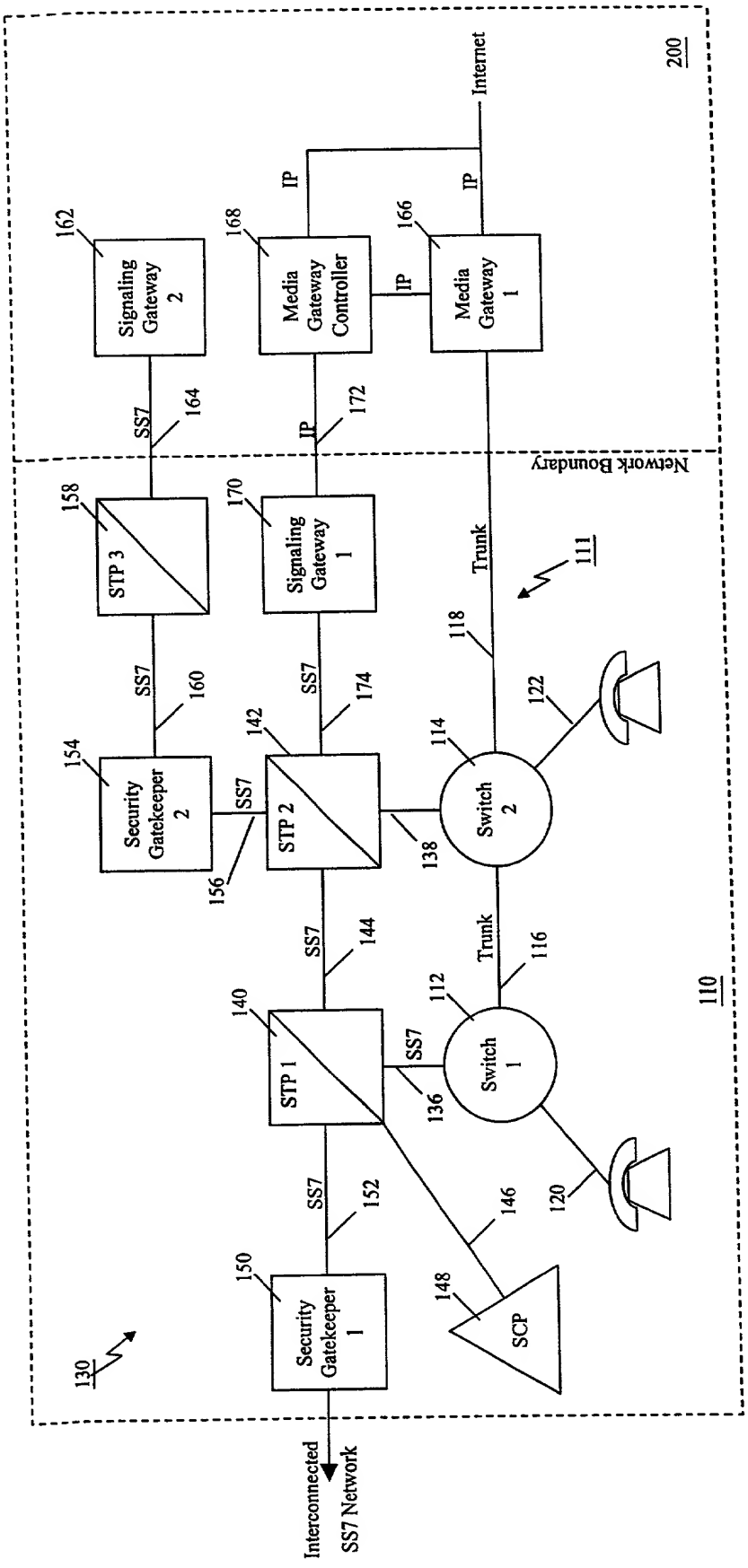

200
Internet
IP
IP
162
Signaling Gateway 2
168
Media Gateway Controller
166
Media Gateway 1
IP
SS7
164
IP
172
Network Boundary
158
STP 3
170
Signaling Gateway 1
Trunk
111
118
SS7
160
SS7
174
122
154
Security Gatekeeper 2
142
114
SS7
STP 2
Switch 2
138
156
SS7
144
Trunk
116
140
112
STP 1
SS7
Switch 1
136
110
SS7
152
146
120
150
148
Security Gatekeeper 1
SCP
130
100
Interconnected SS7 Network

Figure 1

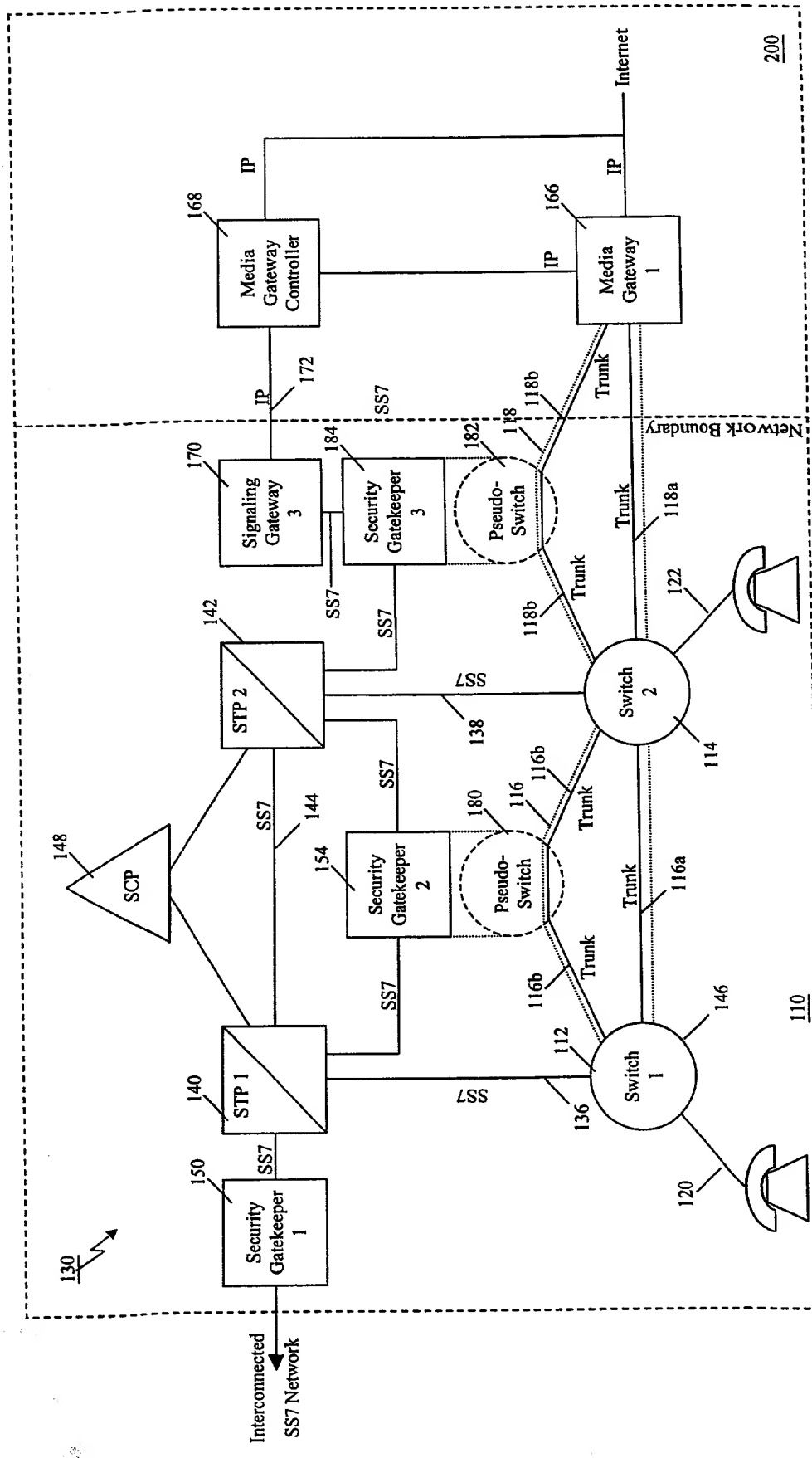

200
Internet
IP
168
Media Gateway Controller
166
Media Gateway 1
172
SS7
Network Boundary
170
Signaling Gateway 3
184
Security Gatekeeper 3
182
Pseudo-Switch
118
118b
Trunk
118a
122
142
STP 2
138
Switch 2
114
116b
116
180
148
SCP
144
154
Security Gatekeeper 2
Pseudo-Switch
116a
146
110
112
140
STP 1
136
Switch 1
150
Security Gatekeeper 1
120
130
100
Interconnected SS7 Network

Figure 2

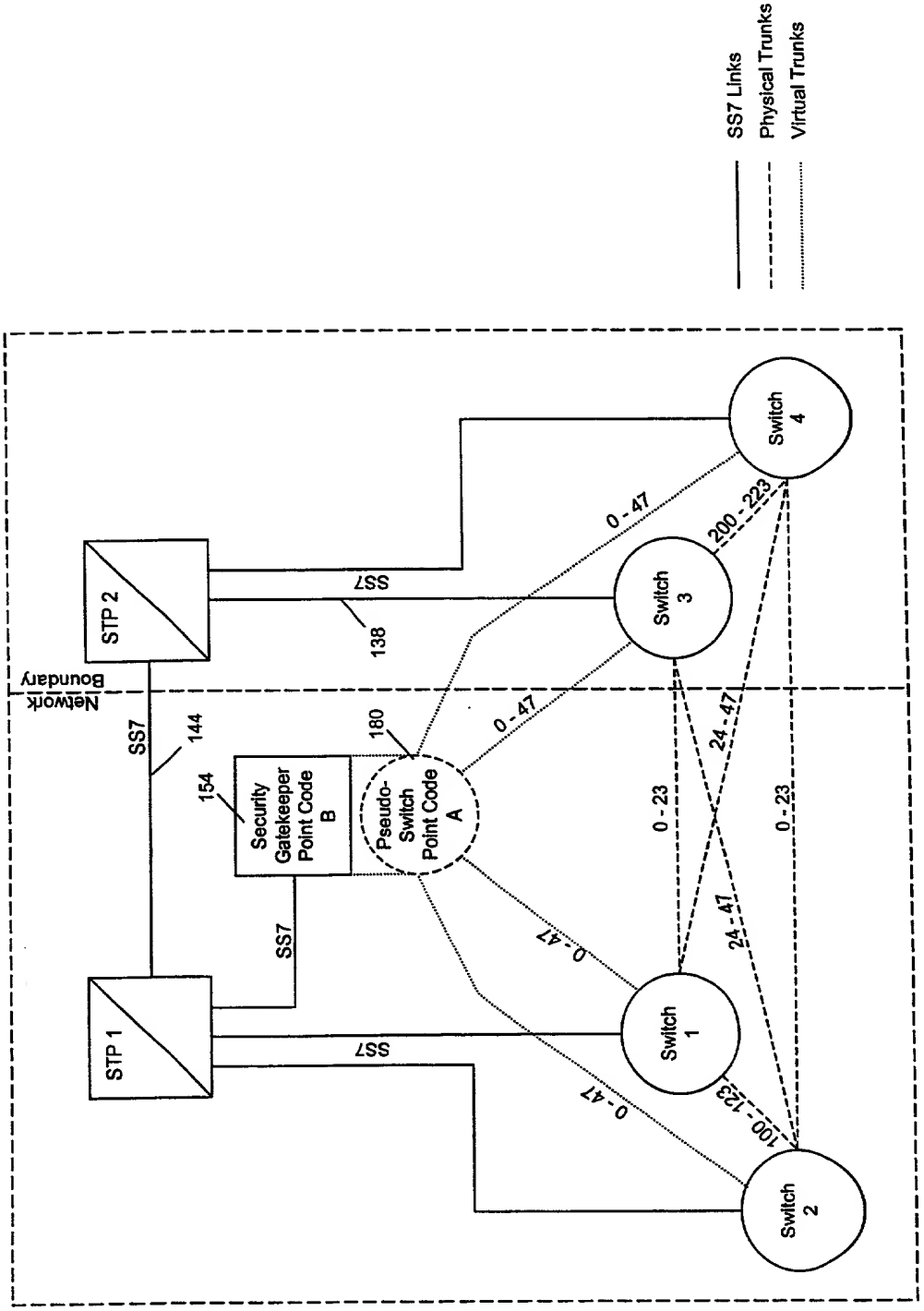


Figure 3

Express Mail No. EV 339905469

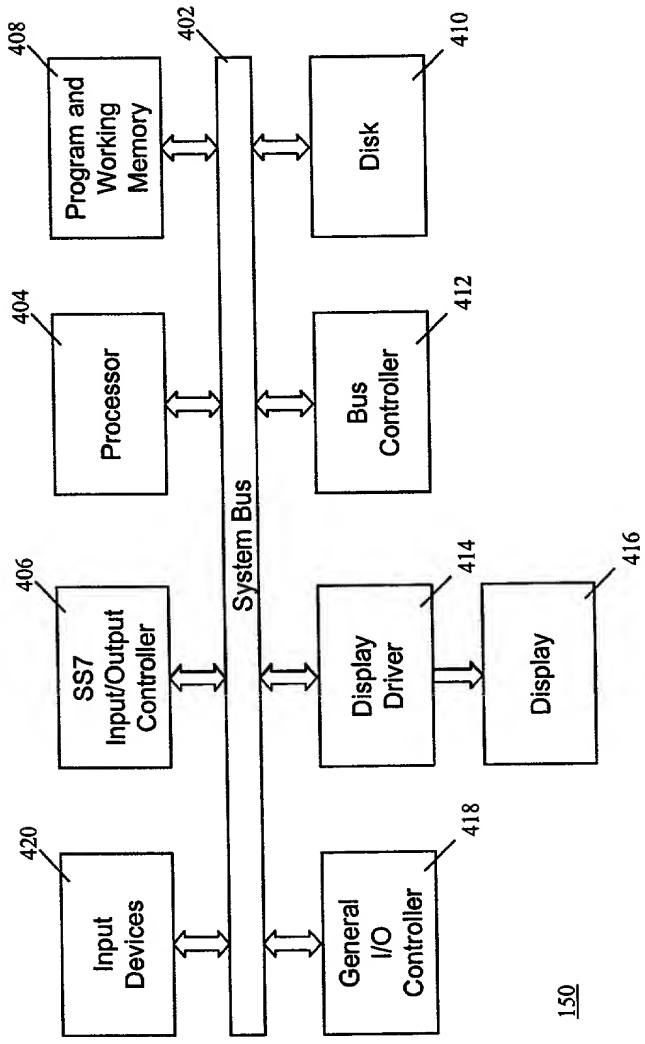
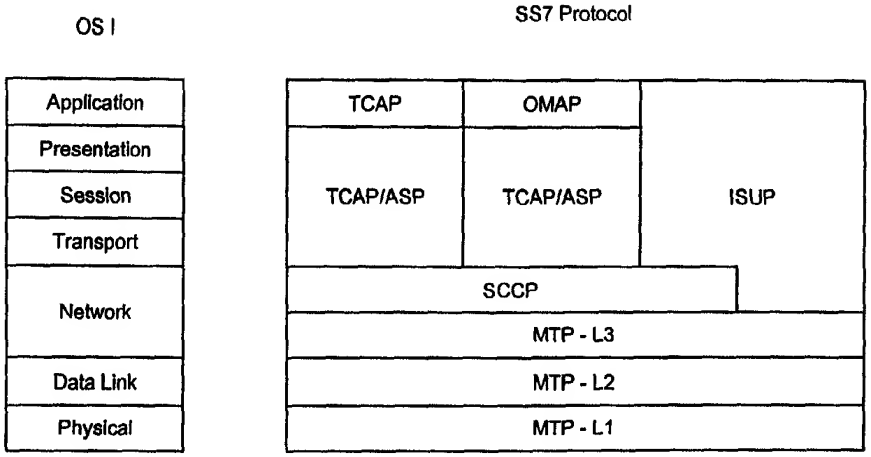

408
Program and Working Memory
402
410
Disk
404
Processor
System Bus
412
Bus Controller
406
SS7 Input/Output Controller
414
Display Driver
416
Display
420
Input Devices
418
General I/O Controller
150

Figure 4

TO2007 2064960



Legend

ASP - Application Service Part (Connection Oriented Protocols
MTP - Message Transfer Part (L1, L2 & L3)
OMAP - Operations, Maintenance, Application Part
SCCP - Signaling Connection Control Part
TCAP - Transaction Capability Application Part

Figure 5

Attny Docket:414.037CIP/10007267
Inventor(s): Arthur DOSKOW, et al
Serial No.: 09/767,902
Date Filed: January 24, 2001
Title: Method and Apparatus for Mediating...
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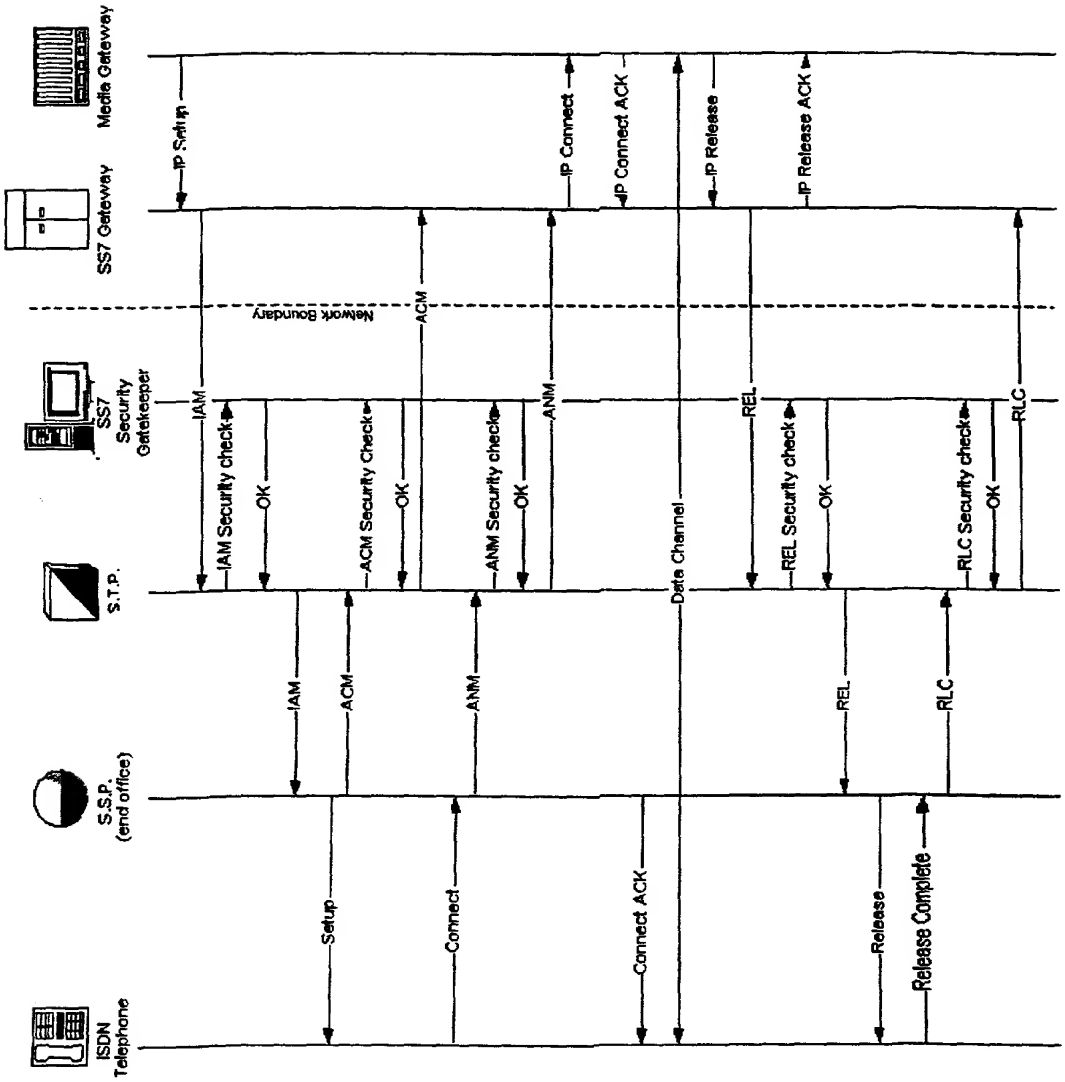

Figure 6

PO2001-206/5760

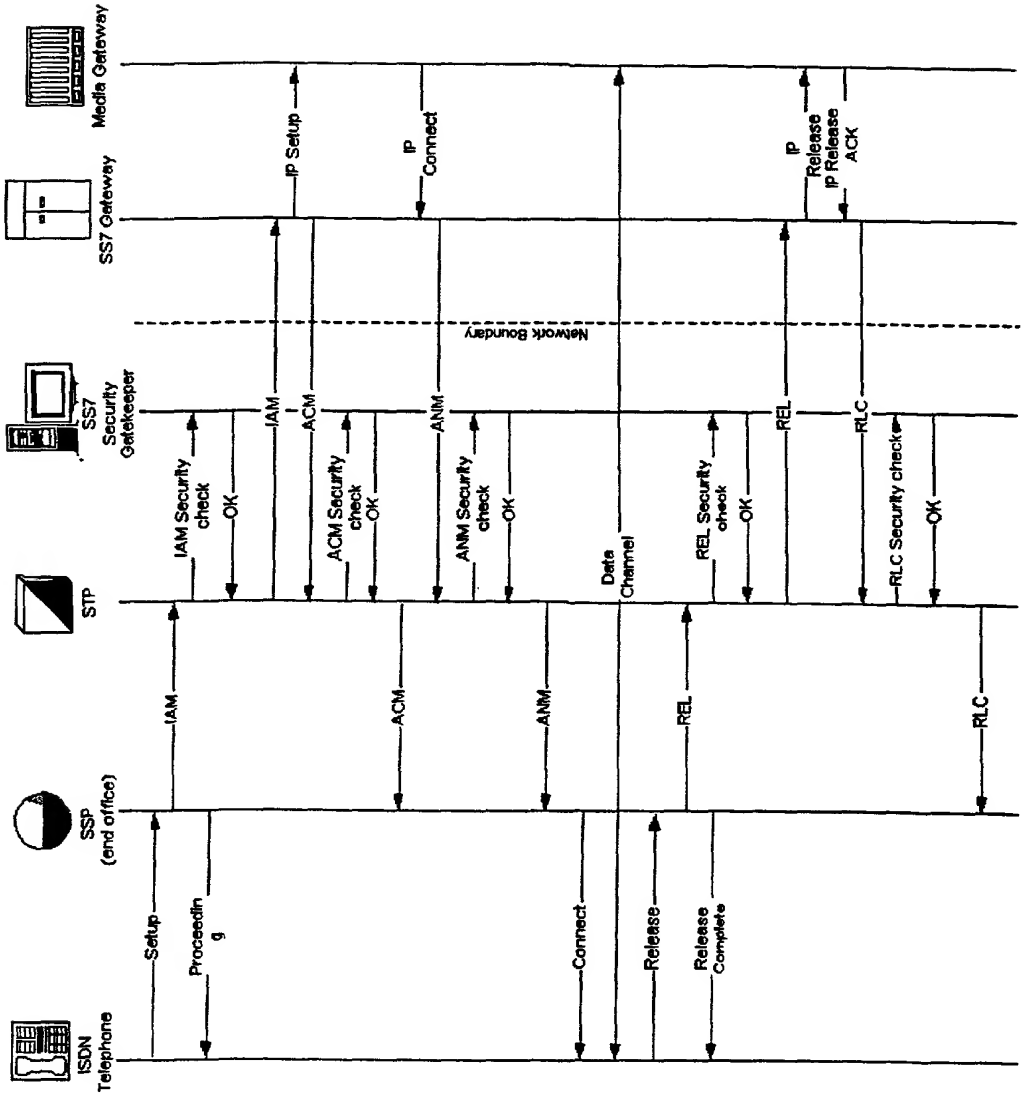
Media Gateway
SS7 Gateway
SS7 Security Gatekeeper
STP
SSP (end office)
ISDN Telephone
IP Setup
IP Connect
IP Release
IP Release ACK
Network Boundary
IAM
ACM
ANM
REL
RLC
IAM Security check
OK
ACM Security check
OK
ANM Security check
OK
Data Channel
REL Security check
OK
RLC Security check
OK
IAM
ACM
ANM
REL
RLC
Setup
Proceeding
Connect
Release
Release Complete

Figure 7

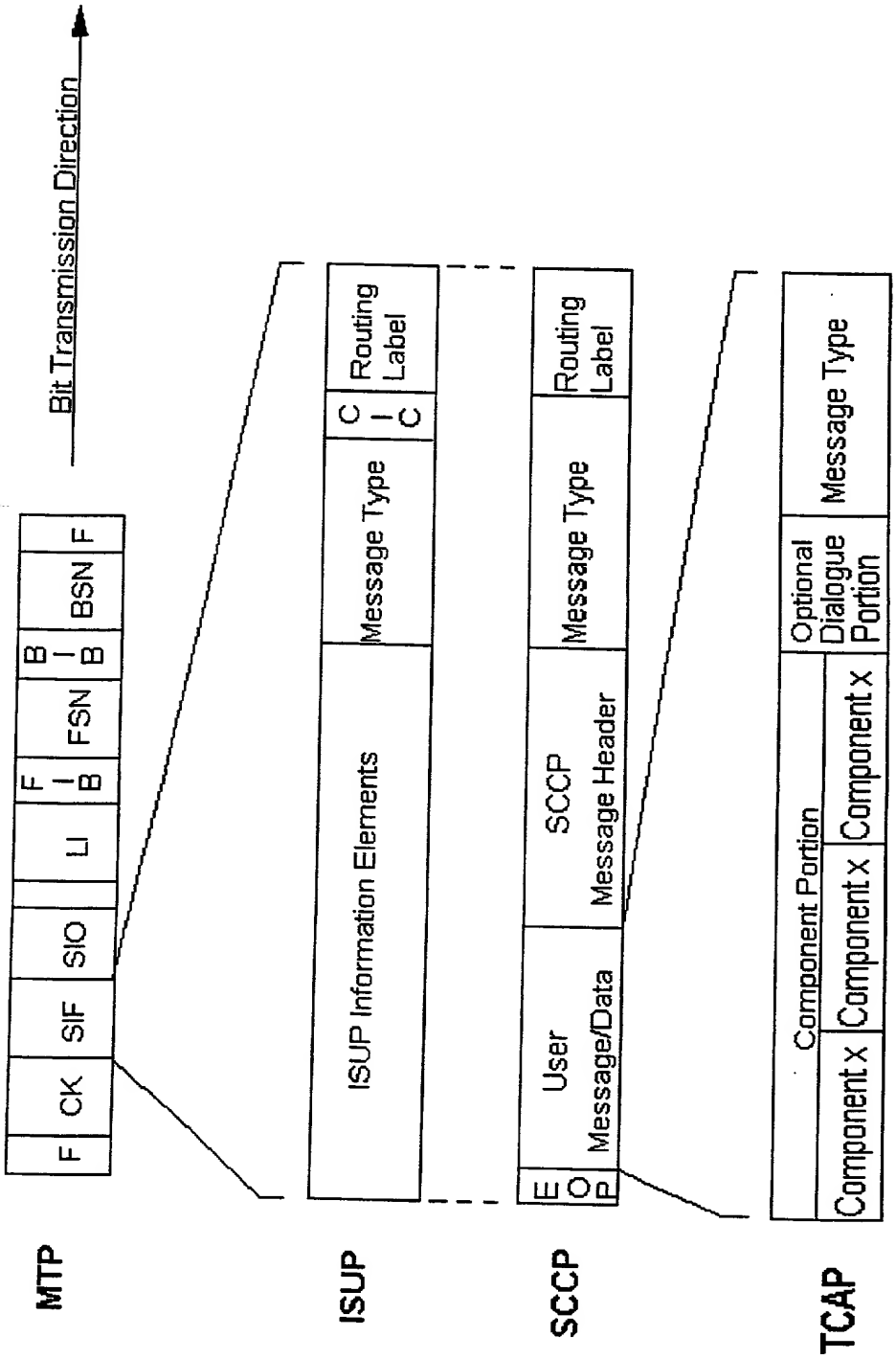
Bit Transmission Direction
MTP
F
CK
SIF
SIO
LI
F I B
FSN
B I B
BSN
F
ISUP
ISUP Information Elements
Message Type
C I C
Routing Label
SCCP
E O P
User Message/Data
SCCP Message Header
Message Type
Routing Label
TCAP
Component Portion
Component x
Component x
Component x
Optional Dialogue Portion
Message Type

Figure 8

T02007F 20679260

ISDN User Part Message Format Coding
(LSSGR GR-606, Iss. 3 11/99)

		8	7	6	5	4	3	2	1
Flag	A	0	1	1	1	1	1	1	0
Forward sequence information	B	BSN/ BIB	Backward Sequence Number						
Backward Sequence information	C	FSN/ FIB	Forward Sequence Number						
Message length indicator	D	Spare		Length Indicator					
Service information	E	National Network Opt.		Mess Priority		MTP User Part (ISUP)			
Routing Label	F	Destination Point Code							
		Origination Point Code							
		Signaling Link Selection							
CIC	G	Circuit Identification Code							
Message Type	H	Message Type							
ISUP Information Element	I	ISUP Parameters							
Check Bits	J	Check Bits							

Figure 9

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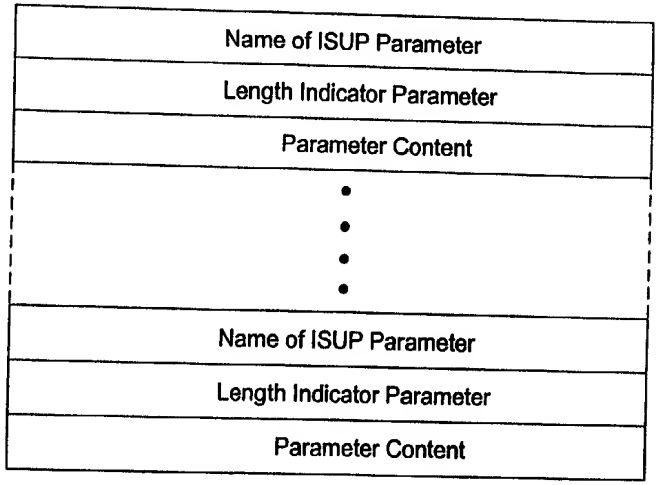

Figure 10

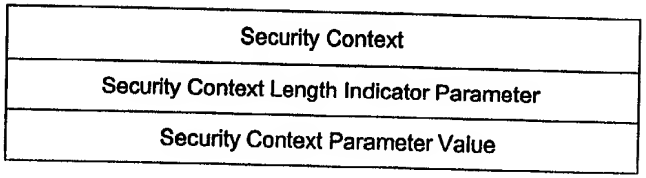

Figure 11

Security Context Values

Value	Meaning
0	Not used.
1	Data Encryption Algorithm
2	Integrity Check
3	Message Code Authentication
4	Sequence, Timestamp and Identification

Figure 12

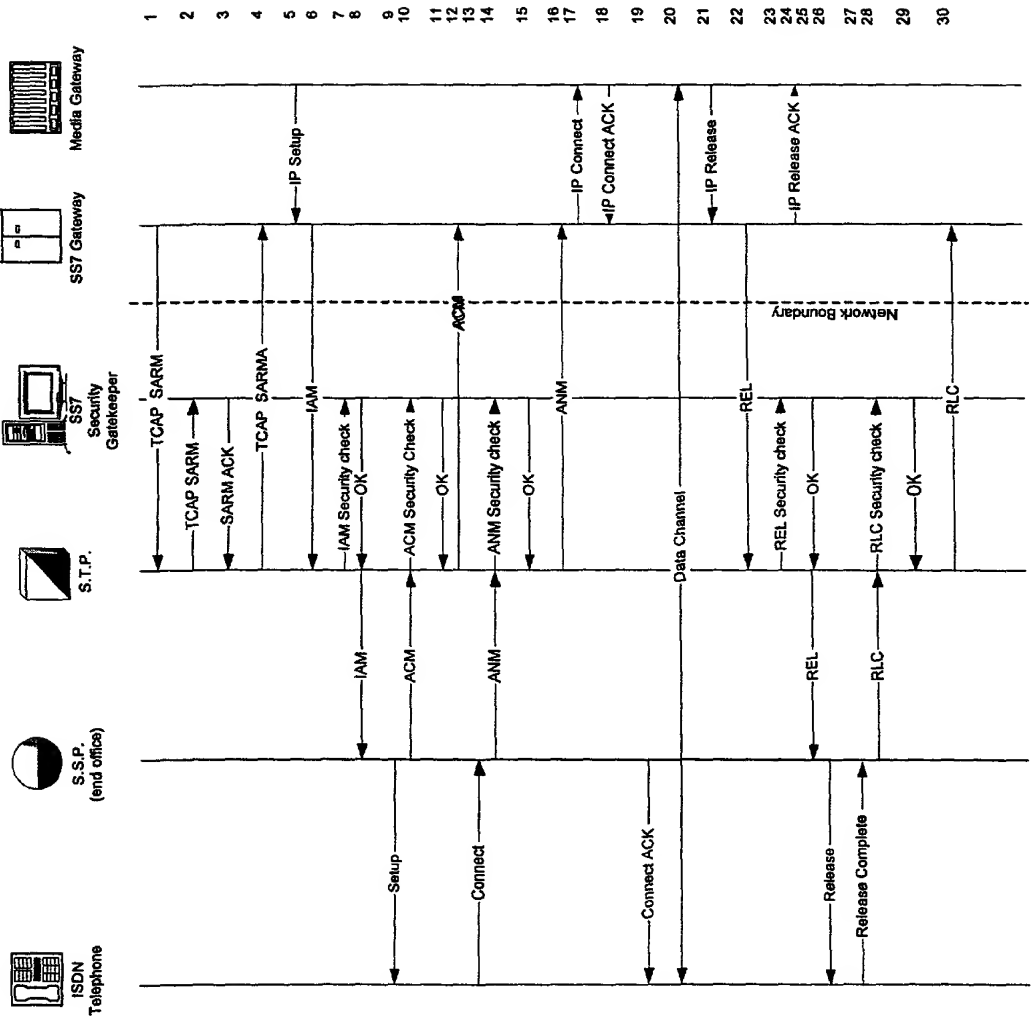
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
Media Gateway
SS7 Gateway
SS7 Security Gatekeeper
S.T.P.
S.S.P. (end office)
ISDN Telephone
IP Setup
IP Connect
IP Connect ACK
IP Release
IP Release ACK
Network Boundary
TCAP SARM
TCAP SARM
SARM ACK
TCAP SARMA
IAM
ACM
ANM
REL
RLC
IAM Security check
OK
ACM Security Check
OK
ANM Security check
OK
Data Channel
REL Security check
OK
RLC Security check
OK
IAM
ACM
ANM
REL
RLC
Setup
Connect
Connect ACK
Release
Release Complete

Figure 13

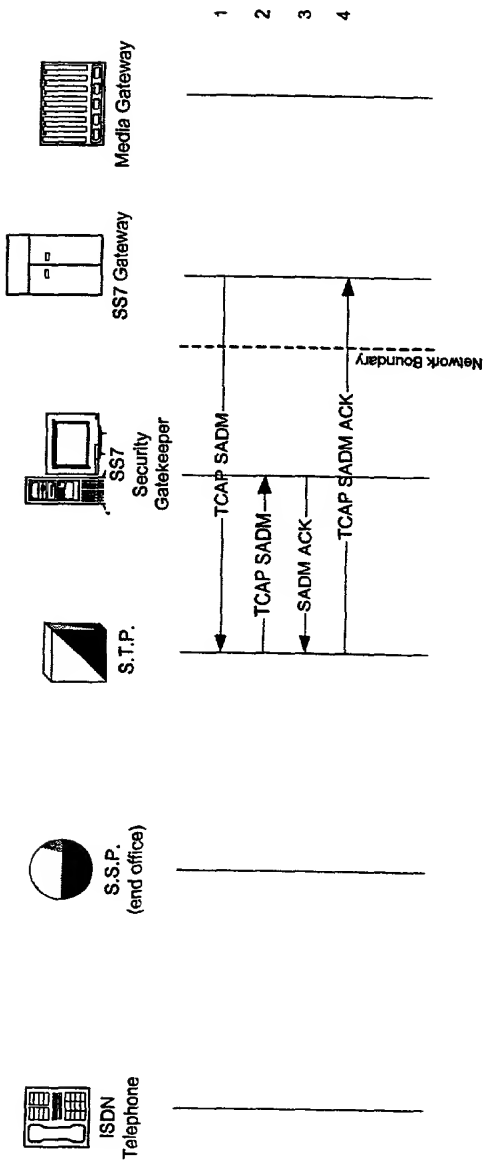
1
2
3
4
Media Gateway
SS7 Gateway
Network Boundary
SS7
Security
Gatekeeper
TCAP SADM
TCAP SADM
SADM ACK
TCAP SADM ACK
S.T.P.
S.S.P.
(end office)
ISDN
Telephone

Figure 14

TO2007 2064760

Initial Address Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 1	
Nature of Connection Indicators	
Forward Call Indicator Bits H..A	
Forward Call Indicator Bits P..I	
Calling Party Category	
Offset of 1st Mandatory Var. Parameter	
Offset of 2nd Mandatory Var. Parameter	
Offset of Start of Operational Part	
Length Indicator of User Service Info	
User Service Information No. of Octets = Length Indicator Value	
Length Indicator of Called Party No.	
Called Party Number No. of Octets = Length Indicator Value	
Optional Parameter Code	
Optional Parameter Length Indicator	
Optional Parameter No. of Octets = Length Indicator Value	
End of Optional Parameters Indicator	

Fig. 15

Address Complete Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 6	
Backward Call Indicator Bits H..A	
Backward Call Indicator Bits P..I	
Offset to Start of Optional Part	
Optional Parameter Code	
Optional Parameter Length Indicator	
Optional Parameter No. of Octets = Length Indicator Value	
End of Optional Parameters Indicator	

Fig. 16

Answer Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 9	
Offset to Start of Optional Part	
Optional Parameter Code	
Optional Parameter Length Indicator	
Optional Parameter No. of Octets = Length Indicator Value	
End of Optional Parameters Indicator	

Fig. 17

Release Complete Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 16	

Fig. 19

Release Message

SIO and Routing Label	
CIC Low-Order Octet	
2-bits spare	CIC High-Order 6-bits
Message Type = 12	
Offset of 1st Mandatory Var. Parameter	
Offset of Start of Operational Part	
Length Indicator of Cause Indicators	
Release Cause Indicator Parameter No. of Octets = Length Indicator Value	
Optional Parameter Code	
Optional Parameter Length Indicator	
Optional Parameter No. of Octets = Length Indicator Value	
End of Optional Parameters Indicator	

Fig 18

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Date Filed: January 24, 2001
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Express Mail No. EV 366250460

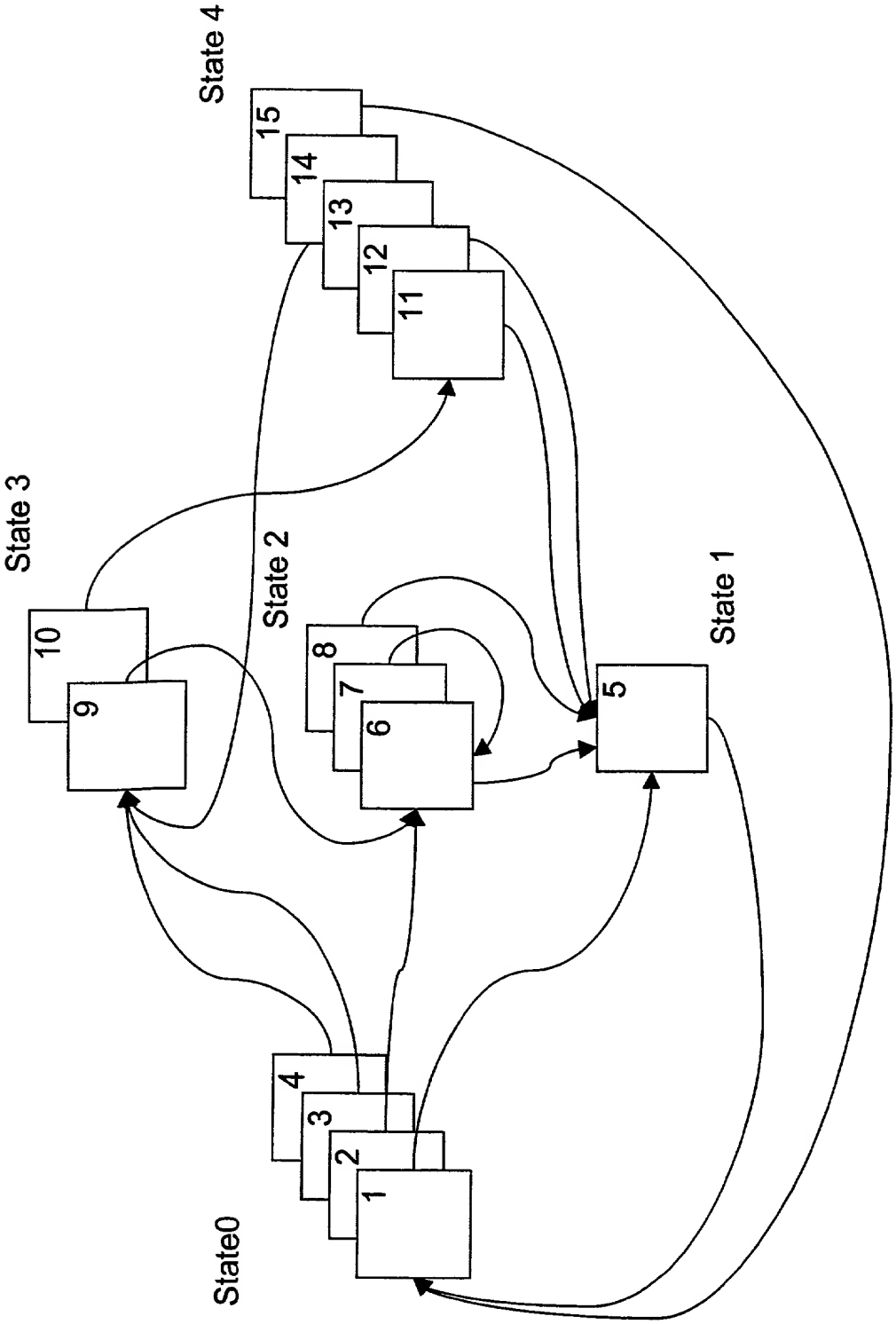

Fig. 20